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Post-Hurricane Disease Surveillance

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On August 29th, 2005, Hurricane Katrina caused extensive damage in Louisiana, including the city of New Orleans. A mandatory evacuation order and flooding of large residential areas resulted in displacement of at least a half-million residents. Within the State of Louisiana alone, there were over 50,000 persons in evacuation centers established by groups such as the American Red Cross, local governments, and faith-based groups.

Disaster-related public health activities have typically emphasized environmental issues for the affected region and rapid needs assessment for the affected population. In addition, surveillance activities are often conducted in affected regions including needs assessments for special populations, surveillance for incidences of injury and carbon monoxide poisoning, and surveillance through existing health care facilities such as emergency departments.

Communicable Disease Surveillance Among Evacuees

Following Hurricane Katrina, public health authorities in the region recognized the importance of conducting surveillance for communicable diseases that had the potential to spread among evacuees. Crowded living conditions are known to create a risk for disease transmission, particularly gastrointestinal and respiratory conditions, with the possibility of large outbreaks. There was also concern regarding other conditions associated with crowding such as wound infections or transmission of skin parasites like lice. In addition to communicable diseases, public health officials decided to include surveillance for chronic medical conditions, traumatic conditions and pre-existing and newly onset mental health conditions.

Active Daily Surveillance of Shelters

State and federal public health agencies, along with the American Red Cross, joined to perform statewide daily surveillance in evacuation centers in Louisiana. Active surveillance was conducted from September 8th through October 26th at known shelters for evacuees. The list of shelters was reviewed on a daily basis to include new shelters or exclude shelters that had closed. A standard one page form was designed for gathering aggregate health data from the medical clinic or health care worker serving the shelter, collecting data based on selected syndromes rather than specific diagnoses. Surveillance was conducted by adapting military programs designed to carry out surveillance for disease or injury in similar situations of living in close proximity such as occurs in barracks.

Continued page 2

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During the 52 days of surveillance, a total of 2975 reports were received covering over 39,000 patient visits to shelter health facilities. A total of 297 of the 489 identified shelters participated in the surveillance at some time during that period. About a third of the population in shelters was covered by the surveillance system. Analysis was done in two ways. Completed surveillance forms were individually reviewed by an epidemiologist looking for unusual events. Data were also entered into a database and analyzed for trends. Both methods identified clusters of illnesses prompting further epidemiologic investigation.

Chronic Conditions

Almost a third of patient visits were related to chronic medical conditions, most commonly cardiovascular disease (including hypertension) and diabetes; each accounted for about 12 visits per day per thousand shelter residents. Asthma or chronic obstructive pulmonary disease (COPD) was another common reason for patient visits. Most of these visits for chronic conditions occurred soon after the hurricane, most likely representing the need to replace lost medications or re-establish medical therapy. Other syndromes identified at low levels included flu-like illness, rashes, watery diarrhea, and wound infections.

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Mental Health

Mental health visits presented another demand to the shelter health facilities. Emotional strain related to family displacement, evacuation living situation, job uncertainty, destruction of homes, and community disruption would be expected to result in significant stresses. Patient visits for pre-existing mental health conditions averaged 6.5 visits per 1000 shelter residents while visits for new mental health conditions averaged 1.6 visits per 1000 shelter residents.

Sanitation

In spite of concerns related to loss of sanitation and safe drinking water, few gastrointestinal outbreaks were identified through this surveillance system. There were several large outbreaks of presumed norovirus gastroenteritis in shelters, characterized by short duration vomiting and diarrhea. Norovirus infections are generally highly communicable, especially in crowded conditions. In addition, one shelter reported a small outbreak of scabies. In a well-vaccinated population with only rare occurences of vaccine-preventable conditions such as measles or rubella, outbreaks of those diseases are not expected and were not identified, in contrast to evacuee situations in other countries.

Continued page 3

Challenges to Surveillance

The effort identified several challenges when conducting post-disaster surveillance. Various shelters opened and closed during the course of surveillance, making it difficult to know where evacuees were located and to obtain surveillance data. Health care resources available in the shelters varied considerably. Case definitions were not applied consistently by the shelters, particularly for influenza-like illness, which complicated data interpretation.

Syndromic Surveillance Assists in Resource Allocation

While both existing and new health conditions will occur among any group of people, they will probably occur more commonly among a group such as evacuees in a disaster setting. Along with infrastructure damage, public health agencies will have reduced resources and greater demands following a disaster. Disease surveillance based on syndromic surveillance can assist with recognizing disease trends in a timely manner and identifying the most critical public health issues so those limited resources can be allocated in the most efficient way.

Through planning and preparation, and reviewing lessons learned from actual events, agencies and institutions responding to disasters can better meet the public health challenges that inevitably follow.

For more information, see:

http://www.bt.cdc.gov/disasters/
